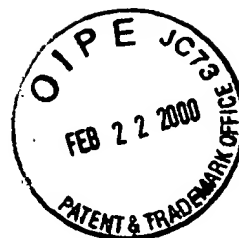


## SEQUENCE LISTING



<110> Segre, Gino V.  
Kronenberg, Henry M.  
Abou-Samra, Abdul-Badi  
Juppner, Harald  
Potts, Jr., John T.  
Schipani, Ernestina

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Met Gly Ala Pro Arg Ile  
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Ser His Ser Leu Ala Leu Leu Leu Cys Cys Ser Val Leu Ser Ser Val  
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Tyr Ala Leu Val Asp Ala Asp Asp Val Ile Thr Lys Glu Glu Gln Ile  
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Ile Leu Leu Arg Asn Ala Gln Ala Gln Cys Glu Gln Arg Leu Lys Glu  
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Val Leu Arg Val Pro Glu Leu Ala Glu Ser Ala Lys Asp Trp Met Ser  
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Arg Ser Ala Lys Thr Lys Lys Glu Lys Pro Ala Glu Lys Leu Tyr Pro  
75 80 85

cag gca gag gag tcc agg gaa gtt tct gac agg agc cgg ctg cag gat 403  
Gln Ala Glu Glu Ser Arg Glu Val Ser Asp Arg Ser Arg Leu Gln Asp  
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Thr Glu Cys Trp Asp Leu Ser Ser Gly Asn Lys Lys Trp Ile Ile Gln	
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Val Pro Ile Leu Ala Ala Ile Val Val Asn Phe Ile Leu Phe Ile Asn	
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ata atc aga gtc ctg gct act aaa ctc cgg gag acc aat gca ggg aga	1267
Ile Ile Arg Val Leu Ala Thr Lys Leu Arg Glu Thr Asn Ala Gly Arg	
375 380 385 390	
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Cys Asp Thr Arg Gln Gln Tyr Arg Lys Leu Leu Lys Ser Thr Leu Val	
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Leu Met Pro Leu Phe Gly Val His Tyr Ile Val Phe Met Ala Thr Pro	
410 415 420	
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Tyr Thr Glu Val Ser Gly Ile Leu Trp Gln Val Gln Met His Tyr Glu	
425 430 435	
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Met Leu Phe Asn Ser Phe Gln Gly Phe Phe Val Ala Ile Ile Tyr Cys	
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Phe Cys Asn Gly Glu Val Gln Ala Glu Ile Lys Lys Ser Trp Ser Arg	
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Trp Thr Leu Ala Leu Asp Phe Lys Arg Lys Ala Arg Ser Gly Ser Ser	
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Thr Tyr Ser Tyr Gly Pro Met Val Ser His Thr Ser Val Thr Asn Val	
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Gly Pro Arg Gly Gly Trp Pro Cys Pro Ser Ala Leu Asp	
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Met Gly Ala Pro Arg Ile	
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Ser His Ser Leu Ala Leu Leu Leu Cys Cys Ser Val Leu Ser Ser Val	
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Tyr Ala Leu Val Asp Ala Asp Asp Val Ile Thr Lys Glu Glu Gln Ile	
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Ile Leu Leu Arg Asn Ala Gln Ala Gln Cys Glu Gln Arg Leu Lys Glu	
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Val Leu Arg Val Pro Glu Leu Ala Glu Ser Ala Lys Asp Trp Met Ser	
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Val Pro Gly Lys Val Val Ala Val Pro Cys Pro Asp Tyr Phe Tyr Asp	
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Phe Asn His Lys Gly Arg Ala Tyr Arg Arg Cys Asp Ser Asn Gly Ser	
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155 160 165	
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Cys Val Lys Phe Leu Thr Asn Glu Thr Arg Glu Arg Glu Val Phe Asp	
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Arg Leu Gly Met Ile Tyr Thr Val Gly Tyr Ser Ile Ser Leu Gly Ser	
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Leu Thr Val Ala Val Leu Ile Leu Gly Tyr Phe Arg Arg Leu His Cys	
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ctc atg ccg cta ttt ggg gtg cac tac atc gtc ttc atg gcc acg ccg Leu Met Pro Leu Phe Gly Val His Tyr Ile Val Phe Met Ala Thr Pro 410 415 420	1363
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ctc tgc tgc cca gtg ctc agc tcc gca tat gcg ctg gtg gat gcg gac Leu Cys Cys Pro Val Leu Ser Ser Ala Tyr Ala Leu Val Asp Ala Asp 15                    20                    25	159	
gat gtc ttt acc aaa gag gaa cag att ttc ctg ctg cac cgt gcc cag Asp Val Phe Thr Lys Glu Glu Gln Ile Phe Leu Leu His Arg Ala Gln 30                    35                    40                    45	207	
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Tyr Ser Tyr Gly Pro Met Val Ser His Thr Ser Val Thr Asn Val Gly	
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Thr Thr Asn Gly His Ser Gln Leu Pro Gly His Ala Lys Pro Gly Ala	
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Pro Ala Thr Glu Thr Glu Thr Leu Pro Val Thr Met Ala Val Pro Lys	
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His Arg Ala Gln Ala Gln Cys Glu Lys Arg Leu Lys Glu Val Leu Gln	
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Arg Pro Ala Ser Ile Met Glu Ser Asp Lys Gly Trp Thr Ser Ala Ser	
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Thr Ser Gly Lys Pro Arg Lys Asp Lys Ala Ser Gly Lys Leu Tyr Pro	
75 80 85	
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Glu Ser Glu Glu Asp Lys Glu Ala Pro Thr Gly Ser Arg Tyr Arg Gly	
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Arg Leu Gly Met 190 Ile Tyr Thr Val Gly Tyr 195 Ser Val Ser Leu Ala Ser	
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ctc acc gta gct gtg ctc atc ctg gcc tac ttt agg cgg ctg cac tgc	678
Leu Thr Val 205 Ala Val Leu Ile Leu Ala Tyr Phe Arg Arg Leu His Cys	
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Thr Arg Asn 220 Tyr Ile His Met 225 His Leu Phe Leu Ser Phe Met Leu Arg	
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gcc gtg agc atc ttc gtc aag gac gct gtg ctc tac tct ggc gcc acg	774
Ala Val Ser 235 Ile Phe Val Lys Asp Ala Val Leu Tyr Ser Gly Ala Thr	
240 245	
ctt gat gag gct gag cgc ctc acc gag gag gag ctg cgc gcc atc gcc	822
Leu Asp Glu Ala Glu Arg Leu Thr Glu Glu Glu Leu Arg Ala Ile Ala	
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cag gcg ccc ccg ccg cct gcc acc gcc gct gcc ggc tac gcg ggc tgc	870
Gln Ala Pro Pro 270 Pro Ala Thr 275 Ala Ala Gly Tyr Ala Gly Cys	
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agg gtg gct gtg acc ttc ttc ctt tac ttc ctg gcc acc aac tac tac	918
Arg Val Ala 285 Val Thr Phe Phe Leu Tyr Phe Leu Ala Thr Asn Tyr Tyr	
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Trp Ile Leu Val Glu Gly Leu Tyr Leu His Ser Leu Ile Phe Met Ala	
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Phe Phe Ser 315 Glu Lys Lys Tyr Leu Trp Gly Phe Thr 325 Val Phe Gly Trp	
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Gly Leu Pro Ala Val Phe Val Ala Val Trp Val Ser Val Arg Ala Thr	
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ctg gcc aac acc ggg tgc tgg gac ttg agc tcc ggg aac aaa aag tgg	1110
Leu Ala Asn Thr 350 Gly Cys Trp Asp Leu Ser Ser Gly Asn Lys Lys Trp	
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gcc ggc cgg tgt gac aca cgg cag cag tac cgg aag ctg ctc aaa tcc Ala Gly Arg Cys Asp Thr Arg Gln Gln Tyr Arg Lys Leu Leu Lys Ser 395 400 405	1254
acg ctg gtg ctc atg ccc ctc ttt ggc gtc cac tac att gtc ttc atg Thr Leu Val Leu Met Pro Leu Phe Gly Val His Tyr Ile Val Phe Met 410 415 420 425	1302
gcc aca cca tac acc gag gtc tca ggg acg ctc tgg caa gtc cag atg Ala Thr Pro Tyr Thr Glu Val Ser Gly Thr Leu Trp Gln Val Gln Met 430 435 440	1350
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ata tac tgt ttc tgc aat ggc gag gta caa gct gag atc aag aaa tct Ile Tyr Cys Phe Cys Asn Gly Glu Val Gln Ala Glu Ile Lys Lys Ser 460 465 470	1446
tgg agc cgc tgg aca ctg gca ctg gac ttc aag cga aag gca cgc agc Trp Ser Arg Trp Thr Leu Ala Leu Asp Phe Lys Arg Lys Ala Arg Ser 475 480 485	1494
ggg agc agc agc tat agc tac ggc ccc atg gtg tcc cac aca agt gtg Gly Ser Ser Ser Tyr Ser Tyr Gly Pro Met Val Ser His Thr Ser Val 490 495 500 505	1542
acc aat gtc ggc ccc cgt gtg gga ctc ggc ctg ccc ctc agc ccc cgc Thr Asn Val Gly Pro Arg Val Gly Leu Gly Leu Pro Leu Ser Pro Arg 510 515 520	1590
cta ctg ccc act gcc acc acc aac ggc cac cct cag ctg cct ggc cat Leu Leu Pro Thr Ala Thr Thr Asn Gly His Pro Gln Leu Pro Gly His 525 530 535	1638
gcc aag cca ggg acc cca gcc ctg gag acc ctc gag acc aca cca cct Ala Lys Pro Gly Thr Pro Ala Leu Glu Thr Leu Glu Thr Pro Pro 540 545 550	1686
gcc atg gct gct ccc aag gac gat ggg ttc ctc aac ggc tcc tgc tca Ala Met Ala Ala Pro Lys Asp Asp Gly Phe Leu Asn Gly Ser Cys Ser 555 560 565	1734
ggc ctg gac gag gag gcc tct ggg cct gag cgg cca cct gcc ctg cta Gly Leu Asp Glu Glu Ala Ser Gly Pro Glu Arg Pro Pro Ala Leu Leu 570 575 580 585	1782
cag gaa gag tgg gag aca gtc atg tgaccaggcg ctgggggctg gacctgctga Gln Glu Glu Trp Glu Thr Val Met 590	1836
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2010

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 <213> Artificial Sequence

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 <213> Artificial Sequence

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 <213> Artificial Sequence

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<220>  
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 Arg Gln Gln Tyr Arg Lys Leu Leu Lys  
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 <223> 1st to last; primer

<400> 14  
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<210> 15  
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 <212> DNA  
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 <223> 1st to last; primer

<400> 15  
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<220>  
 <223> 1st to last; primer

<400> 16  
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<210> 17  
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<220>  
 <223> 1st to last; primer

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 Thr Lys Glu Glu Gln Ile Ile Leu Leu Arg Asn Ala Gln Ala Gln Cys  
 35 40 45

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 35 40 45  
 Glu Gln Arg Leu Lys Glu Val Leu Arg Val Pro Glu Leu Ala Glu Ser  
 50 55 60  
 Ala Lys Asp Trp Met Ser Arg Ser Ala Lys Thr Lys Lys Glu Lys Pro  
 65 70 75 80  
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 Arg Ser Arg Leu Gln Asp Gly Phe Cys Leu Pro Glu Trp Asp Asn Ile  
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 Val Cys Trp Pro Ala Gly Val Pro Gly Lys Val Val Ala Val Pro Cys  
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 Pro Asp Tyr Phe Tyr Asp Phe Asn His Lys Gly Arg Ala Tyr Arg Arg  
 130 135 140  
 Cys Asp Ser Asn Gly Ser Trp Glu Leu Val Pro Gly Asn Asn Arg Thr  
 145 150 155 160  
 Trp Ala Asn Tyr Ser Glu Cys Val Lys Phe Leu Thr Asn Glu Thr Arg  
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 Glu Arg Glu Val Phe Asp Arg Leu Gly Met Ile Tyr Thr Val Gly Tyr  
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 Phe Arg Arg Leu His Cys Thr Arg Asn Tyr Ile His Met His Leu Phe  
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 Val Ser Phe Met Leu Arg Ala Val Ser Ile Phe Ile Lys Asp Ala Val  
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 Glu Leu Arg Ala Phe Thr Glu Pro Pro Pro Ala Asp Lys Ala Gly Phe  
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 Phe Met Ala Phe Phe Ser Glu Lys Lys Tyr Leu Trp Gly Phe Thr Leu  
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 Arg Ala Thr Leu Ala Asn Thr Glu Cys Trp Asp Leu Ser Ser Gly Asn  
 340 345 350  
 Lys Lys Trp Ile Ile Gln Val Pro Ile Leu Ala Ala Ile Val Val Asn  
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 Phe Ile Leu Phe Ile Asn Ile Ile Arg Val Leu Ala Thr Lys Leu Arg  
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 385 390 395 400  
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 405 410 415  
 Val Phe Met Ala Thr Pro Tyr Thr Glu Val Ser Gly Ile Leu Trp Gln  
 420 425 430  
 Val Gln Met His Tyr Glu Met Leu Phe Asn Ser Phe Gln Gly Phe Phe  
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465					470					475					480
Ala	Arg	Ser	Gly	Ser	Ser	Thr	Tyr	Ser	Tyr	Gly	Pro	Met	Val	Ser	His
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Thr	Ser	Val	Thr	Asn	Val	Gly	Pro	Arg	Gly	Gly	Leu	Ala	Leu	Ser	Leu
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Ser	Pro	Arg	Leu	Ala	Pro	Gly	Ala	Gly	Ala	Ser	Ala	Asn	Gly	His	His
		515					520					525			
Gln	Leu	Pro	Gly	Tyr	Val	Lys	His	Gly	Ser	Ile	Ser	Glu	Asn	Ser	Leu
	530					535					540				
Pro	Ser	Ser	Gly	Pro	Glu	Pro	Gly	Thr	Lys	Asp	Asp	Gly	Tyr	Leu	Asn
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Gly	Ser	Gly	Leu	Tyr	Glu	Pro	Met	Val	Gly	Glu	Gln	Pro	Pro	Pro	Leu
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Thr	Lys	Glu	Glu	Gln	Ile	Phe	Leu	Leu	His	Arg	Ala	Gln	Ala	Gln	Cys
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Asp	Lys	Leu	Leu	Lys	Glu	Val	Leu	His	Thr	Ala	Ala	Asn	Ile	Met	Glu
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Ser	Asp	Lys	Gly	Trp	Thr	Pro	Ala	Ser	Thr	Ser	Gly	Lys	Pro	Arg	Lys
	65				70					75					80
Glu	Lys	Ala	Ser	Gly	Lys	Phe	Tyr	Pro	Glu	Ser	Lys	Glu	Asn	Lys	Asp
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Val	Pro	Thr	Gly	Ser	Arg	Arg	Arg	Gly	Arg	Pro	Cys	Leu	Pro	Glu	Trp
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Asp	Asn	Ile	Val	Cys	Trp	Pro	Leu	Gly	Ala	Pro	Gly	Glu	Val	Val	Ala
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Asn	Arg	Thr	Trp	Ala	Asn	Tyr	Ser	Glu	Cys	Leu	Lys	Phe	Met	Thr	Asn
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Glu	Thr	Arg	Glu	Arg	Glu	Val	Phe	Asp	Arg	Leu	Gly	Met	Ile	Tyr	Thr
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		195					200					205			
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His	Met	Phe	Leu	Ser	Phe	Met	Leu	Arg	Ala	Ala	Ser	Ile	Phe	Val	Lys
	225				230					235					240
Asp	Ala	Val	Leu	Tyr	Ser	Gly	Phe	Thr	Leu	Asp	Glu	Ala	Glu	Arg	Leu
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Thr	Glu	Glu	Glu	Leu	His	Ile	Ile	Ala	Gln	Val	Pro	Pro	Pro	Pro	Ala
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Ala	Ala	Ala	Val	Gly	Tyr	Ala	Gly	Cys	Arg	Val	Ala	Val	Thr	Phe	Phe
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 Tyr Leu His Ser Leu Ile Phe Met Ala Phe Phe Ser Glu Lys Lys Tyr  
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 Leu Trp Gly Phe Thr Ile Phe Gly Trp Gly Leu Pro Ala Val Phe Val  
 325 330 335  
 Ala Val Trp Val Gly Val Arg Ala Thr Leu Ala Asn Thr Gly Cys Trp  
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 Asp Leu Ser Ser Gly His Lys Lys Trp Ile Ile Gln Val Pro Ile Leu  
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 Ala Ser Val Val Leu Asn Phe Ile Leu Phe Ile Asn Ile Ile Arg Val  
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 385 390 395 400  
 Gln Gln Tyr Arg Lys Leu Leu Arg Ser Thr Leu Val Leu Val Pro Leu  
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 420 425 430  
 Ser Gly Thr Leu Trp Gln Ile Gln Met His Tyr Glu Met Leu Phe Asn  
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 Leu Asp Phe Lys Arg Lys Ala Arg Ser Gly Ser Ser Ser Tyr Ser Tyr  
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 Gly Pro Met Val Ser His Thr Ser Val Thr Asn Val Gly Pro Arg Ala  
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 Ser Asp Lys Gly Trp Thr Ser Ala Ser Thr Ser Gly Lys Pro Arg Lys  
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 85 90 95  
 Ala Pro Thr Gly Ser Arg Tyr Arg Gly Arg Pro Cys Leu Pro Glu Trp  
 100 105 110  
 Asp His Ile Leu Cys Trp Pro Leu Gly Ala Pro Gly Glu Val Val Ala  
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Asn	Arg	Thr	Trp	Ala	Asn	Tyr	Ser	Glu	Cys	Val	Lys	Phe	Leu	Thr	Asn
				165					170						175
Glu	Thr	Arg	Glu	Arg	Glu	Val	Phe	Asp	Arg	Leu	Gly	Met	Ile	Tyr	Thr
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Val	Gly	Tyr	Ser	Val	Ser	Leu	Ala	Ser	Leu	Thr	Val	Ala	Val	Leu	Ile
	195						200					205			
Leu	Ala	Tyr	Phe	Arg	Arg	Leu	His	Cys	Thr	Arg	Asn	Tyr	Ile	His	Met
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His	Leu	Phe	Leu	Ser	Phe	Met	Leu	Arg	Ala	Val	Ser	Ile	Phe	Val	Lys
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Thr	Glu	Glu	Glu	Leu	Arg	Ala	Ile	Ala	Gln	Ala	Pro	Pro	Pro	Pro	Ala
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Gly	Pro	Met	Val	Ser	His	Thr	Ser	Val	Thr	Asn	Val	Gly	Pro	Arg	Val
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Gly	Leu	Gly	Leu	Pro	Leu	Ser	Pro	Arg	Leu	Leu	Pro	Thr	Ala	Thr	Thr
	515						520					525			
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Asp	Gly	Phe	Leu	Asn	Gly	Ser	Cys	Ser	Gly	Leu	Asp	Glu	Glu	Ala	Ser
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